

Rawson (3)

VITAL STATISTICS  
OF THE CITY OF  
BUENOS AYRES.

BY  
G. RAWSON, M. D.,  
DELEGATE FROM THE MEDICAL ASSOCIATION OF BUENOS AYRES TO THE  
INTERNATIONAL MEDICAL CONGRESS AT PHILADELPHIA



NEW YORK:  
D. APPLETON AND COMPANY,  
549 & 551 BROADWAY.  
1876.

# APPLETONS' PERIODICALS.

## APPLETONS' JOURNAL:

A MONTHLY MISCELLANY OF POPULAR LITERATURE.

NEW SERIES.

TWENTY-FIVE CENTS PER NUMBER. THREE DOLLARS PER ANNUM.

APPLETONS' JOURNAL is now published monthly; it is devoted to popular literature and all matters of taste and general culture—published at a price to bring it within the reach of all classes. It contains superior fiction, in the form of serials and short stories; papers graphically descriptive of picturesque places; articles upon men of note, and upon the habits of different peoples; essays upon household and social topics; articles of travel and adventure; scientific and industrial articles written in a graphic and popular style. In brief, the aim is to be comprehensive, including in its plan all branches of literature and all themes of interest to intelligent readers. Each number is illustrated.

TERMS: Three dollars per annum, postage prepaid, to all subscribers in the United States; or Twenty-five Cents per number. A Club of Four Yearly Subscriptions will entitle the sender to an extra subscription gratis; that is, five copies will be sent one year for twelve dollars. For \$7.20, APPLETONS' JOURNAL and THE POPULAR SCIENCE MONTHLY (full price, eight dollars), postage prepaid.

## THE POPULAR SCIENCE MONTHLY.

Conducted by E. L. YOUMANS.

This periodical was started (in 1872) to promote the diffusion of valuable scientific knowledge, in a readable and attractive form, among all classes of the community, and has thus far met a want supplied by no other magazine in the United States.

Containing instructive and interesting articles and abstracts of articles, original, selected, translated, and illustrated, from the pens of the leading scientific men of different countries; accounts of important scientific discoveries, the application of science to the practical arts, and the latest views put forth concerning natural phenomena, have been given by *savants* of the highest authority. Prominent attention has been also devoted to those various sciences which help to a better understanding of the nature of man, to the bearings of science upon the questions of society and government, to scientific education, and to the conflicts which spring from the progressive nature of scientific knowledge.

THE POPULAR SCIENCE MONTHLY is published monthly in a large octavo, handsomely printed on clear type, and, when the subjects admit, fully illustrated.

TERMS: \$5.00 per annum, or Fifty Cents per Number. Postage prepaid to all Subscribers in the United States.

## THE ART JOURNAL:

*An International Gallery of Engravings,*

BY DISTINGUISHED ARTISTS OF EUROPE AND AMERICA;

WITH ILLUSTRATED PAPERS IN THE VARIOUS BRANCHES OF ART.

THE ART JOURNAL is a monthly publication, quarto size, superbly illustrated and printed, and specially devoted to the world of Art—Painting, Sculpture, Architecture, Decoration, Engraving, Etching, Enameling, and Designing in all its branches—having in view the double purpose of supplying a complete illustrated record of progress in the Arts, and of affording a means for the cultivation of Art-taste among the people. Each number is richly and abundantly illustrated on both steel and wood, and no pains are spared to render this "ART JOURNAL" the most valuable publication of the kind in the world. It contains the Steel Plates and Illustrations of the LONDON ART JOURNAL, a publication of world-wide fame (the exclusive right of which, for Canada and the United States, has been purchased by the publishers); with *extensive additions devoted principally to American Art and American topics. Published monthly. Sold only by Subscription.* Price, 75 Cents per Number; \$9.00 per Annum, postage prepaid.

Subscriptions received by the Publishers, or their Agents. AGENCIES: 22 Hawley St., Boston; 922 Chestnut St., Philadelphia; 22 Post-Office Avenue, Baltimore; 53 Ninth St., Pittsburg; 100 State St., Albany; 42 State St., Rochester; 103 State St., Chicago; 30 W. 4th St., Cincinnati; 305 Locust St., St. Louis; 20 St. Charles St., New Orleans; 230 Sutter St., San Francisco.

D. APPLETON & CO., Publishers, 549 & 551 Broadway, N. Y.

VITAL STATISTICS  
OF THE CITY OF  
BUENOS AYRES.

BY  
G. RAWSON, M. D.,

DELEGATE FROM THE MEDICAL ASSOCIATION OF BUENOS AYRES TO THE  
INTERNATIONAL MEDICAL CONGRESS AT PHILADELPHIA.



NEW YORK:  
D. APPLETON AND COMPANY,  
549 & 551 BROADWAY.  
1876.



## VITAL STATISTICS OF BUENOS AYRES.

---

A BRIEF review of the vital statistics of Buenos Ayres may perhaps awaken some interest in the International Medical Congress shortly to assemble in Philadelphia, not only as adding one more to the data accumulated from day to day as elements of the sanitary science, but as presenting circumstances peculiar to that Argentine city itself.

Buenos Ayres, next to Rio de Janeiro, the most populous city in South America, has grown with extreme rapidity, having tripled its population within the last twenty-five years, mainly owing to the vast tide of emigration from the European shores. But, even in the event of a diminution of the influx of immigrants, and a corresponding reduction of the rate of increase, it is almost certain that Buenos Ayres will, at the close of the present century, have upward of half a million inhabitants.

Situated in latitude 35° south, with a genial climate, it is exempt from the extremes of temperature so common in other localities; and, were it not for the modifying influences exercised upon its sanitary condition by the increase of population and by the circumstances usually attending that increase—when not overruled by strict observance of the admonitions of science—it would be as healthy a city as its name (*good air*) would seem to bespeak.

But the death-rate in Buenos Ayres attains proportions by no means satisfactory; and the recent epidemics, particularly the yellow-fever scourge of 1871-'72, show that much has to

be done before the city can regain that salubrity reasonably to be expected from its situation and soil, and from the prevailing winds and other climatic conditions with which it is favored by Nature.

Epidemics are warnings to mankind—warnings all the louder in proportion to the severity of the visitation; and Buenos Ayres has learned from her recent sufferings the lesson to be desired. Works, both above and beneath the surface, are now in prosecution for the sanitary improvement of the city, by means of a system of drainage and underground disinfection, to cost twenty millions of hard dollars (eight millions have already been expended), and which, when completed, will be one of the most efficient in the world.

Besides, the population of the city is, to a great extent, composed of foreign elements permanently incorporated therein, and constantly increasing. In this respect Buenos Ayres bears a striking analogy to many cities in the United States, and, like these, presents a series of phenomena peculiar to this species of social evolution, as revealed in the vital statistics. The analogy here referred to I shall endeavor to point out in the course of the present essay.

#### POPULATION OF BUENOS AYRES.

It is necessary, first of all, to determine the population of Buenos Ayres and its component elements, the accurate accomplishment of which, however, is difficult, owing to the long intervals between the censuses and the rapid increase of the number of inhabitants. The mode of development in cities of the New World is in general so irregular that, in measuring their growth, it will not suffice merely to determine the difference between the number of births and deaths. The increase resulting from that tardy process is insignificant when compared with that derived by immigration and by the irresistible attractions which populous centres exercise at all times upon neighboring towns. This species of attraction is, from causes peculiar to the Argentine Republic, more powerful in Buenos Ayres than in other American cities of similar growth. In 1871, for example, the number of victims of the



disastrous yellow-fever epidemic exceeded that of the births in the same year by 13,206; but the equilibrium of the population was more than reëstablished by the influx of emigrants from Europe and from the surrounding provinces and republics.

By comparing the total number of births during the quinquennium 1858-'72 with the total number of deaths during the same period, including, of course, the victims of the cholera of 1867 and 1868 and those of the yellow fever of 1871, we observe a decrease of 1,778 in the population. Hence, if Buenos Ayres had depended solely upon the vegetative progression for its growth, its population, instead of increasing, would have been diminished. Meantime, the ravages of such frightful mortality were more than compensated by immigration and attraction, and the remarkable growth of the city pursued its course without any apparent interruption.

The progress becomes more and more marked dating from 1852. In the absence of official data it is scarcely possible to estimate the population of Buenos Ayres in that year, which was marked by a political event of transcendent importance—the downfall of the dictatorship by which the nation had been oppressed and depopulated for the space of twenty years. Numerous emigrants returning to their homes after a prolonged proscription; the establishment of liberty, political and civil; the opening the navigable rivers to the vessels of all nations; the discovery of riches susceptible of being developed advantageously in the Argentine Republic by the hand of man; and the facilities offered by both the government and the people to foreigners desiring to take up their residence there, induced a stream of European immigrants which continued uninterruptedly for a number of years. Dating from the beginning of the influx of foreigners, the rapid growth of the population becomes evident, and about that time the greatest increase took place. Nevertheless, no census of the city was taken until 1855, nor was a second effected until 1869, the year of the general census of the republic. According to the terms of the constitution the general census will in future be taken every ten years.

The two censuses referred to are, therefore, the only avail-

able data on which to base my computations; those for other years must, of necessity, be only approximate.

In the census of 1855 the total population of the city was set down at 91,548, and in the general census of 1869 at 177,787. Hence, the mean annual rate of increase during the period embraced between those two extremes would be 4.8, always supposing the progression to have been uniform. Now, by applying the same system of reckoning to the previous years, that is to say, from 1852, and to the successive years down to 1875, the population of Buenos Ayres would be as in the annexed table in the years therein expressed :

1851, by calculation .....	76,000 inhabitants.	
1855, according to census.....	91,548	"
1869, " " .....	177,787	"
1875, by calculation .....	230,000	"

On reviewing the foregoing statement of the increase of the population, two objections seem to offer, and I must now endeavor to explain them. They are: first, the epidemic of 1871, which would appear to have checked for the time being the numerical advancement of the population; and, second, the perceptibly decreased immigration in the last two years, 1874 and 1875.

Buenos Ayres is not only the chief port, but also, by reason of its position, the natural centre of all movement in the republic. It is the point of disembarkment for the immigrant on his arrival, and of reëmbarkment for those who return to Europe. Passengers, whether immigrants or not, coming from Montevideo, likewise land at Buenos Ayres; and there they go on shipboard again when leaving to go back. There, too, is the rendezvous of all craft navigating the tributary streams of the Rio de la Plata. Hence, the movement of passengers throughout the year may at all times be readily ascertained, and the balance to the credit or debit of Buenos Ayres accurately determined by comparison of the arrivals and departures. The communications by land are extremely limited, and confined to the rural districts of Buenos Ayres and the neighboring provinces. It is generally admitted that more than two-thirds of all immigrants to the republic, come



whence they may, remain in Buenos Ayres city, the remainder being distributed through the surrounding country.

The following table shows the movement of passengers for the port of Buenos Ayres in the years 1864-'72 :

YEARS.	Arrivals.	Departures.	Balance remaining.
1864.....	29,307	16,745	12,562
1865.....	30,556	24,434	6,122
1866.....	40,132	20,658	19,474
1867.....	42,729	21,154	21,575
1868.....	56,354	25,342	31,012
1869.....	73,045	29,990	43,055
1870.....	81,166	33,450	47,716
1871.....	49,741	28,468	21,273
1872.....	70,991	36,756	34,235

As seen in the foregoing table, in 1870, the year immediately following the general census, the balance in favor of the population reached the highest point hitherto known, as far as the arrival and departure of passengers are concerned. That year was an auspicious one for the city. Immediately after the termination of the Paraguayan war a vast accumulation of capital was effected, credit facilities opened up, encouragement offered to such as desired to embark in new industrial enterprises, and important public works undertaken, such, for instance, as city railroad lines; and the result of all these favorable circumstances was the attraction to and permanent establishment in Buenos Ayres of a vast number of people from foreign countries and from the other provinces of the republic. The influx of strangers at that time amounted to two-thirds of the balance of 47,716 mentioned in the table, that is to say, over 30,000 new inhabitants, which is equivalent to three and one-fourth times the usual rate of increase. Such an excessive augmentation of numbers, at a time when the city was not suitably prepared to receive them or afford them necessary accommodation, gave rise to an accumulation altogether incompatible with the general good health, and contributed, beyond all doubt, to the awful severity of the epidemic of 1871, by which more than 12,000 foreigners were carried off.

The yellow fever committed its ravages in the midst of an overcrowded city. But, notwithstanding the great mortality, there still remained, with a surplus for the following year, a mass of inhabitants greater than would have been obtained by calculation, adopting the established annual rate of increase, and to which should be added the number of the immigrants of 1871 who settled in the city. These remarks may serve to meet the first objection above alluded to.

As for the second, suffice it to state that, in 1872, the tide of immigration again began to flow, and foreigners arrived in such numbers as to leave a balance of 34,235; and that in 1873 immigration reached the highest figure ever attained in South America, leaving a balance much more favorable still than that of the year immediately preceding, though I deeply regret that I have not at hand the official returns to offer in support of this statement.

In 1874 and 1875, by local causes easily explained, and others of a general character which have produced and still produce such grave perturbation in commercial and industrial circles throughout the world, immigration to Buenos Ayres was considerably diminished, while emigration was increased in a proportionate degree. There has, nevertheless, been no instance as yet, even at the worst, of the departures having exceeded, or even equaled, the arrivals; a balance, however small, still exists in favor of the latter.

Now, taking into consideration the excessive accumulation which occurred in the two years immediately preceding the crisis, the same reasoning may be applied to 1874 and 1875 as we have already applied to 1871, with the favorable difference in the case of the two former that they were marked by no such catastrophe as the epidemic to exercise a depressing influence upon the population. Hence, the adoption here of the mean annual rate which served us in estimating the number of inhabitants for the earlier periods would seem perfectly justifiable; and we may, without any fear of exaggeration, set down the population of Buenos Ayres in 1875 at 230,000.

This population is spread over an area of 1,620 hectares (or 6 square miles approximately), or a mean of 70 square metres ( $= 83\frac{2}{3}$  sq. yds.) to each individual. Of course, the dis-

tribution is not always uniform. There are many districts much more densely populated than others, and the tenement-houses, though disseminated through all the districts, are in themselves centres of accumulation, pernicious alike to the physical and moral well-being of the community. The streets are for the most part narrow, barely eleven metres in width ; and the public squares are few and of inconsiderable dimensions. Within the last few years a vast system of horse-railways has been introduced, with an aggregate length of 70 miles, by means of which cheap mode of conveyance a certain degree of expansion is afforded to the inhabitants. It may here be observed that, with the exception of Philadelphia, Buenos Ayres has, in proportion to its population, a greater extent of horse-car lines than any other city in the world.

From the short history of the development of the population of Buenos Ayres it may be presumed that it is largely composed of foreign elements. Indeed, the census of 1869 shows that in that year almost one-half the total number of inhabitants were foreigners :

Total population . . . . .	177,787
Argentines . . . . .	89,666
Foreigners . . . . .	88,121
	<hr/>
	177,787

Doubtless the proportion of foreigners has increased in a marked degree since that time, and, in the absence of precise data, I calculate that their number in 1875 exceeded that of the natives as follows :

Total population . . . . .	230,000
Argentines . . . . .	105,000
Foreigners . . . . .	125,000
	<hr/>
	230,000

But, in order to give an idea of this foreign mixture, and commence the study of the vital statistics upon a more solid basis, I shall here transcribe a page from the census returns of 1869, with all the details and particulars to which we may have occasion to refer.

## POPULATION OF THE CITY OF BUENOS AYRES IN 1860.

ACCORDING TO NATIONALITIES AND SEX.

NATIONALITIES.	To 1 Year.		2 to 5.		6 to 10.		11 to 15.		16 to 20.		21 to 30.		31 to 40.		41 to 50.		51 to 60.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
INDEPENDENT AMERICA :																		
Argentines.....	3,704	3,565	6,672	7,136	7,070	7,668	5,568	6,858	3,022	5,811	4,292	8,240	2,909	5,543	2,043	3,712	1,343	2,089
Bolivians.....				1		2	1	1	9	8	26	13	11	2	4			
Brazilians.....	3	1	15	26	32	25	31	24	54	46	123	60	93	37	54	93	32	15
Chilians.....			1	1	5	4	9	13	46	30	86	32	65	23	51	21	21	14
North Americans.....			2	6	7	6	15	8	47	13	239	20	128	11	57	7	21	2
Uruguayans.....	48	25	150	129	266	221	414	325	620	449	1,003	770	423	361	164	225	94	142
Paraguayans.....	1	2	15	11	43	37	68	25	64	17	1,117	33	78	11	32	7	12	10
Peruvians.....	1						2	2	4	4	3	13	2	7	6	4	9	2
From other parts of America.....				2	1	1	3	2	4	4	15	15	13	7	5	2	4	2
EUROPE :																		
Austrians.....				2	3	1	3	4	46	2	241	17	109	11	44	1	11	3
Germans.....	2	1	21	17	29	27	27	32	88	72	596	234	431	160	175	79	53	28
Belgians.....			2	1	3		4	2	4	8	98	16	39	14	17	4	5	2
Spaniards.....	15	16	87	90	151	158	471	305	1,604	496	3,706	1,035	2,478	718	1,937	410	496	179
French.....	26	12	97	103	168	172	302	242	919	585	2,810	1,524	2,229	1,051	1,320	671	490	251
English.....	9	2	28	20	45	46	71	67	192	132	809	368	453	106	257	125	101	59
Italians.....	82	75	559	584	954	818	1,881	1,026	2,670	1,629	9,490	4,063	7,428	2,612	3,852	1,387	1,313	636
Portuguese.....	1	1	2				6	3	39	4	274	20	141	11	105	10	80	7
Swiss.....	2	5	11	11	20	13	35	23	112	60	417	114	262	72	118	36	33	12
From other European countries.....	2	2	2	7	6	5	29	7	190	38	538	63	298	62	146	26	46	29
Africans.....		1	2	1	4		4	3	9	5	48	13	34	14	39	24	40	39
Asiatics.....								2	2		3		2		3	2	1	1
Not classified.....		2						1	8		6		4					
Totals.....	3,896	3,711	7,666	8,094	8,812	9,209	8,949	8,971	9,733	9,407	24,870	16,652	17,635	10,892	9,727	6,761	4,241	3,592

## POPULATION OF THE CITY OF BUENOS AYRES IN 1889.

ACCORDING TO NATIONALITIES AND SEX.

NATIONALITIES.	61 to 70.		71 to 80.		81 to 90.		91 to 100.		101 and up-ward.		Age unknown.		RECAPITULATION.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	TOTAL.
INDEPENDENT AMERICA :															
Argentines .....	612	987	223	425	43	110	10	29	3	2	2	.....	37,486	52,175	89,661
Bolivians .....	1	3	2	2	.....	3	.....	.....	.....	.....	.....	.....	60	27	87
Brazilians .....	13	2	4	1	2	2	.....	.....	.....	.....	.....	.....	455	262	717
Chilians .....	11	3	4	1	2	.....	.....	.....	1	.....	.....	.....	312	144	456
North Americans.....	8	3	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	526	77	603
Uruguayans.....	49	56	14	25	3	7	.....	2	1	1	.....	.....	3,249	2,738	5,987
Paraguayans.....	3	3	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	437	156	593
Peruvians.....	3	3	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	43	25	68
From other parts of America .....	1	1	1	.....	.....	2	.....	.....	.....	.....	.....	.....	47	38	85
EUROPE :															
Austrians.....	7	2	2	.....	.....	.....	.....	.....	.....	.....	33	.....	499	43	542
Germans .....	33	19	5	4	1	.....	.....	.....	.....	.....	.....	.....	1,461	578	2,039
Belgians.....	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	116	47	163
Spaniards .....	167	76	59	25	12	4	2	.....	1	.....	.....	.....	10,486	3,512	13,998
French.....	183	113	60	27	9	6	.....	.....	2	.....	.....	.....	8,625	4,777	13,402
English.....	64	81	23	7	1	3	.....	.....	.....	.....	1	14	2,054	1,027	3,081
Italians.....	458	230	127	56	29	15	4	2	1	.....	5	1	28,883	13,074	41,957
Portuguese.....	38	3	14	3	5	1	1	1	.....	.....	778	.....	711	67	778
Swiss.....	13	2	6	2	1	.....	.....	.....	.....	.....	33	.....	1,030	350	1,380
From other European countries.....	13	6	9	4	2	.....	2	.....	2	.....	.....	.....	1,315	347	1,662
Africans.....	27	45	31	40	20	24	2	7	8	3	.....	.....	263	219	482
Asiatics.....	1	1	.....	3	.....	1	.....	.....	.....	.....	.....	.....	12	9	21
Not classified.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	21	4	25
Totals.....	1,719	1,590	586	624	128	177	21	41	14	6	75	16	98,091	79,696	177,787



The attention is at once attracted by the numerical relation of the predominant elements in the native and foreign populations respectively. It should be borne in mind that among immigrants to Buenos Ayres the male element is far in excess of the female, and that for reasons as obvious as they are natural. The pioneers of emigration are always robust men in the prime of life; and not until prolonged experience has proved the certainty of happy results do the women and families set out to share the fortunes of the fathers and brothers who have left their native homes. Immigration in the United States has now assumed a character of permanency and stability induced by satisfactory experiments extending over more than half a century; nor is it to be wondered at that emigrants arrive on the shores of the Union in a state of almost complete family organization, or, at least, that 45 per cent. of them are females of all ages. And it is a noteworthy fact that the distribution of female immigrants throughout the country is, according to the census of 1870, in direct ratio as the age of the States. In Maine, New York, and Massachusetts, for instance, the female foreign population is equal to, or often in excess of, the male; while in the new States and the Territories the number of females in the foreign population is small as compared to that of the males, save in the single Territory of Utah, where, for well-known reasons, the reverse is the rule.

The population of Buenos Ayres in 1869 comprised :

Males of all ages and nationalities.....	98,091
Females       "       "       "       .....	79,696
Total.....	<hr/> 177,787

The Argentine branch of the population, of all ages, comprised, in the same year: males, 37,486; females, 52,175; or an excess of 14,689 females.

In the foreign branch, including all ages and nationalities, there were: males, 60,605; females, 27,521; or an excess of 33,084 males, which not only compensates the deficiency of males in the Argentine population, but constitutes an excess of 18,395 males in the total number of inhabitants.

In regard to age, children under five years number 23,367,



of whom 2,290 were born in foreign countries. In New York the number of children of that age, so interesting in the study of vital statistics, is equal to 11.8 per cent. of the whole population, while in Buenos Ayres it constitutes only 13.1 per cent. From the age of five to fifteen the proportion of foreign-born children gradually increases, which is likewise observed to be the case in New York, as shown by the report of the Commissioners of Emigration for 1875, in which children not over twelve years of age represent 21 per cent. of the 84,000 immigrants who arrived at this port in the year mentioned.

The period ranging from sixteen to sixty years is that in which the numerical superiority of the foreign population is most marked in Buenos Ayres; and the same phenomenon is observed in New York, though without the strange proportions characteristic of the former city. This is the period of life in which full physical and moral development is attained—plenitude of power for labor, for reproduction, and even for organic resistance of the permanent influences which menace health and existence. In this triple point of view the foreign population is certainly superior wherever it presents, as it does in Buenos Ayres, such an evident majority of individuals in the age of vigor and strength.

#### MARRIAGES.

The following table shows the number of marriages that took place in each of the seven years from 1867 to 1873. I have taken care to compare the numbers with the population in the respective years, calculating the latter according to the established rate of increase, in order to ascertain the number of persons per thousand married in each year:

YEARS.	Marriages.	Number of Persons married per 1,000.
1867.....	1,530	19.0
1868.....	1,703	20.2
1869.....	1,858	20.9
1870.....	1,916	20.5
1871.....	1,896	19.4
1872.....	2,193	21.4
1873.....	2,291	21.3
Mean number of persons married } per 1,000 during seven years.. }	.....	20.39

From this table it appears that the number of marriages increased gradually, save in the year 1871, in which there was a decrease of 20 as compared with the figures of the year immediately preceding, due to the perturbation caused by the great epidemic. In the succeeding years the increase is again visible, as was also that of the population. It is likewise to be observed that the proportion per thousand varied very little, and may be set down at an average of 20, though the mean for the seven years was 20.39.

Figures in statistics assume greater importance when compared with others of like nature. Here, as in other branches of the present report, I prefer to make the comparison with the city of New York, not only because I have ready access to the official documents relating to the vital statistics of this populous city, but also on account of a certain analogy which I find it to bear to Buenos Ayres in the department which now engages my attention.

The number of marriages in New York in each of the same seven years, as given in the vital statistic reports published by the Board of Health, and for which I am indebted to the courtesy of Dr. Nagle, will be seen in the subjoined table. I should add that, in computing the rate per 1,000 of persons who married, I estimated the population before and after the census of 1870, according to the rate of increase—say 2.1 per cent.—adopted by the official authorities :

YEARS.	Marriages.	Persons married per 1,000.
1867.....	7,144	16.14
1868.....	6,926	15.33
1869.....	8,695	18.44
1870.....	7,985	14.71
1871.....	8,646	18.07
1872.....	9,008	18.52
1873.....	8,887	17.72
Average.....		16.99

This mean annual rate may be regarded as somewhat below the truth for New York, inasmuch as the Registrar-general, in the course of his reports, complains of the culpable negligence of some of the persons required by law to have

marriages registered in the proper office. At all events, the data I have adopted as the basis of my calculations are of official origin, and they show the increase in the number of marriages to be not uniform, as is likewise the proportion per 1,000. This variability or lack of uniformity I am at a loss to know how to account for, nor am I aware to what causes, social or economical, to attribute it.

I shall add, by way of comparison, a list of the marriages in nine American cities in the year 1872, observing that the population of the city of New York has been increased in the proportion corresponding to two years after the census.

1872.

CITIES.	Marriages.	Number per 1,000 of Persons married.
New York.....	9,008	18.52
Boston.....	3,762	28.38
Philadelphia.....	6,496	19.28
Richmond.....	567	18.90
Providence.....	943	26.46
Pittsburg.....	1,143	26.56
Albany.....	613	16.14
Newark.....	1,241	23.62
Jersey City.....	677	15.74
Buenos Ayres.....	2,193	21.04

In view of the heterogeneous composition of the population it is important in a statistical point of view to inquire into the nationality of the consorts. The results of observation in this respect are, in Buenos Ayres, as follows :

*Marriages according to the Nationality of the Consorts.*

Argentines.		Foreigners.	
1869 {	Males..... 444	Males.....	1,414
	Females..... 719	Females.....	1,139
	<u>1,163</u>		<u>2,553</u>
1870 {	Males..... 519	Males.....	1,397
	Females..... 770	Females.....	1,146
	<u>1,289</u>		<u>2,543</u>
1871 {	Males..... 478	Males.....	1,418
	Females..... 737	Females.....	1,159
	<u>1,215</u>		<u>2,577</u>

Argentines.		Foreigners.	
1872	Males.....	485	Males..... 1,708
	Females.....	722	Females..... 1,471
		<u>1,207</u>	<u>3,179</u>
1873	Males.....	418	Males..... 1,873
	Females.....	758	Females..... 1,533
		<u>1,176</u>	<u>3,406</u>

In these five years the number of foreigners who married is seen to exceed by far that of the Argentines. And if, for the sake of greater accuracy, we take the year 1869, bearing in mind that the foreign and the Argentine elements were then almost equal, the different nationality of the persons who married can only be explained by special comparison of the foreign element in relation to age and sex. Thus, the number of Argentines who contracted marriage in the year referred to was 1,163, and that of the foreigners of both sexes, 2,553—that is to say, about 2.19 of the latter to 1 of the former. It is also noticed that the number of Argentine males is in still greater disproportion to that of the foreign males, namely 444 to 1,414, or as 1 to 3.18. Still another comparison with one of the foreign nationalities. The Italian population is set down in the census at 41,957, against 89,661 Argentines. Now, the number of Italians who married in the course of that year reaches 1,304, and that of the Argentines, 1,163, of both sexes, while the Italian males amount to 704, and the Argentines to only 444. A similar phenomenon takes place in New York in a series of years. Let us take, for example, the year 1873:

Natives.		Foreigners.	
Males.....	2,688	Males.....	6,183
	Females..... 3,530		Females..... 5,341
	<u>6,218</u>		<u>11,524</u>

Here they stand in the proportion of 1 to 1.8 of both sexes, the proportion of males being even greater—1 to 2.3.

The same observation may be made in New York with reference to the German nationality as that I have just made with respect to the Italians in Buenos Ayres. The German

population, according to the census, amounts to 151,216, the native being 523,198. Meantime, while but 6,218 native Americans of both sexes contracted matrimony, the number of Germans who married was 6,340. And, in order to render the analogy still more marked, let us mention that the American males who entered into wedlock numbered only 2,688, and the Germans 3,416.

#### BIRTHS.

The same uniformity of progression appears in the births. It may almost be stated with certainty that the number of births follows the increase of the population, preserving with it a uniform proportion, which proves that the registration has been carefully attended to, and that my estimate of the population before and after the census was neither excessive nor deficient. Although I have the registers from 1855 down to 1873, I only adopt in the following table those relating to the five years commencing with that of the census, and consequently including the unhappy year 1871 :

YEARS.	Population.	Births.	Rate per 1,000.
1869.....	177,787	6,994	39.3
1870.....	186,320	7,561	40.5
1871.....	195,262	7,549	38.6
1872.....	204,634	8,078	39.4
1873.....	214,456	8,559	39.9
Mean annual rate per 1,000.....			39.5

Continuing the comparison with the vital movement in New York, I transcribe from the official documents the number of births during the same five years, in relation to the population calculated according to its successive growth :

YEARS.	Births.	Rate per 1,000.
1869.....	13,947	15.17
1870.....	14,524	15.41
1871.....	20,821	21.64
1872.....	22,068	22.45
1873.....	22,683	22.61
Mean annual rate per 1,000.....		19.45



The different rates in the first two years as compared to the others may perhaps, in the absence of a visible specific cause, be attributed to a defective system for the registry of births. But, even taking the proportion of 22.61 per 1,000, which is the maximum, it is far from the mean annual rate in Buenos Ayres.

The accompanying table will show the proportion of births in a few cities of Europe and America, and which serves to demonstrate how variable that proportion is in different nations, though not on account of difference of race, but from other and complex causes which must, sooner or later, come within the range of sanitary science :

CITIES.	Births in 1873.	Rate per 1,000.
Brussels .....	6,200	33.51
London .....	121,100	36.05
Bordeaux .....	5,036	25.95
Berlin .....	36,281	38.19
Dublin .....	9,031	28.70
Milan .....	9,091	33.52
Mexico .....	9,273	41.21
Boston .....	9,688	35.07
Brooklyn .....	5,027	11.54
Philadelphia .....	17,811	23.74
“ (1874) .....	19,387	24.07
Chicago .....	9,718	24.29

In some American cities the proportion of births is so low, as observed by the Board of Health of Philadelphia in its reports, as only to be accounted for by defective registration. If such be the case, the necessity of reform is evident in this very important department of statistics.

The matrimonial statistics with respect to the nationality of the consorts would seem to promise a like proportion in the births with respect to the nationality of the parents. I shall confine my examples in the following tables to births of children whose parents were either both Argentines or both foreigners, omitting cases of parents of mixed nationalities, one of whom is Argentine and the other foreigner, and cases without any specification.



YEARS.	BIRTHS.		Proportion.
	Parents both Argentines.	Parents both Foreigners.	
1869.....	1,512	3,314	1 to 2.0
1870.....	1,403	3,881	1 " 2.7
1871.....	1,564	4,019	1 " 2.4
1872.....	1,580	4,451	1 " 2.8
1873.....	1,543	4,738	1 " 3.0

The proportion of children of foreign parents to children of Argentine parents increased from 1 to 2 in 1869 to 1 to 3 in 1873, it being worthy of remark that the augmentation coincides with the most extensive immigration.

Here, again, I meet the same analogies as before between Buenos Ayres and New York, as set forth in the subjoined table, in which are included only births of children of American parents and children of foreign parents.

YEARS.	BIRTHS.		Proportion.
	American Parents.	Foreign Parents.	
1869.....	2,457	9,080	1 to 3.7
1870.....	2,553	9,282	1 " 3.6
1871.....	2,631	14,144	1 " 3.8
1872.....	3,721	14,829	1 " 3.9
1873.....	3,827	15,353	1 " 4.0

In New York the excess of births of children of foreign parents as compared with those of American parents is still more remarkable, inasmuch as it reached the proportion of 4 to 1 in 1873. This extraordinary proportion is far in excess of that suggested by the number of marriages according to nationalities, and would indicate that the fecundity of these different classes of persons is affected by other causes, as proved by the two following facts: 1st. That the predominance of males over females is greater among children of foreign than among those of American parents. 2d. That according to the curious observation contained in the tables of statistics published by the New York Board of Health

from 1870 to 1873, among American mothers whose children were registered in those years,

35	had had up to that time.	12	children each.
17	" " " " .....	13	" "
9	" " " " .....	14	" "
5	" " " " .....	15	" "
2	" " " " .....	16	" "
1	" " " " .....	18	" "

---

69

And among foreign mothers there were counted

215	with.....	12	children.
119	" .....	13	"
57	" .....	14	"
17	" .....	15	"
12	" .....	16	"
11	" .....	17	"
4	" .....	18	"
1	" .....	19	"

---

436

making a total of 436 fecund foreign mothers, and only 69 Americans, the fecundity of the latter appearing, too, in a lesser degree than that of the former.

### MORTALITY.

I have now reached the most painful portion of my review. In regard to the sanitary condition of Buenos Ayres, I must state facts plainly as I apprehend them to exist, not merely because science should be in possession of the whole truth, but also because the truth may serve a useful end in stimulating the praiseworthy efforts now being made to remedy the evils which menace the public health in that city.

Annual reports of the vital statistics of Buenos Ayres have only been published within the last few years, and always so late as to have lost much of their interest when they reach the eyes of the few persons who consult them. The public is for the most part ignorant of the number of deaths that have occurred during the year, and is altogether unaware of the proportion existing between the mortality and the population,

so that the belief still prevails that the city is very healthy. From time to time such epidemics appeared as small-pox, scarlatina, or measles, often carrying away large numbers of people; but such visitations were regarded as temporary exacerbations of death, which, once past, would give place to returning health and all its attendant blessings. In 1858 a yellow fever epidemic, confined within the narrow limits of a single ward of the city, made from three to four hundred victims. As the same disease had raged to a fearful extent the previous year at the neighboring city of Montevideo, its appearance in Buenos Ayres produced a profound impression of terror, and caused a large number of the inhabitants to flee to the rural districts; but the epidemic having proved of short duration, and its effects somewhat limited, it was believed that the sanitary condition of the city was so perfect as to prevent the spreading of the horrible malady, and a general complaint arose against the quarantine department for want of vigilance, in allowing the introduction of an exotic disease. Spite of the frequent returns of small-pox and scarlatina, of typhoid fever, and the mortality caused by the *tetanus infantum* (popularly called the "seven days' sickness"), and other diseases common among children, the idea of the salubrity of the city still prevailed in the public mind.

In 1867 Asiatic cholera made its first appearance, and the following year it returned, extending its ravages through the surrounding country and most of the provinces of the interior. Much greater, indeed, would have been the alarm in Buenos Ayres, if timely publicity had been given to the disastrous effects of the warnings from Nature, who in no instance allows any violation of her laws to pass with impunity. Much greater, I say, would have been the alarm, for the people would then have been made aware that the number of deaths in 1867 had reached 8,029, or 49.9 per 1,000 of the entire population, and 38.9 per 1,000 in 1868. As it was, however, the evil was productive of some good results; works were undertaken for supplying the city with running water; and the cleaning of the streets and other sanitary details coming within the province of the municipal police were more regularly and efficiently performed.

The year 1869 was a peculiarly favorable one for determining the real sanitary condition of the city, there being no epidemic just then in Buenos Ayres, and the general health being, to all appearance, perfectly satisfactory. The census of the population was taken in the year just mentioned, and that was the juncture fixed upon for inquiring into the real nature of the city as a habitable centre, and examining the status of its account current between life and death, always bearing in mind that, after the disappearance of severe epidemics, the relative death-rate decreases in a sensible degree.

Now, had a report of the vital statistics then been drawn up and published, it would have exhibited a mortality of 5,982 for the year last referred to, or 33 per 1,000 of the inhabitants who had just been numbered, and shown that, with such a usual rate, Buenos Ayres could not appear to advantage beside other civilized cities, in which latter—even including the most populous of Europe and America—the mean annual death-rate is, with very few and marked exceptions, much lower. Then would the existence have become evident of permanent causes, the removal of which was indispensable in order to the improvement of the public health. It would also have been discovered that those causes tended to heighten the severity of epidemics, and that something more was necessary than merely defending the entrance to the city against the invasion of pestilence (even could such defense, which is rarely the case, be rendered efficacious), namely, the purification of the city itself, in order to render it salubrious under all circumstances, and weaken the virulence of disease in the event of extraordinary visitations.

In 1870 peace and prosperity reigned undisturbed in the city, the general health seemed good, immigrants were flocking in in hitherto unprecedented numbers, labor was abundant and well remunerated, and capital easily obtained, and commerce and industry were more active than ever before. Buenos Ayres was all contentment, and looked with evident satisfaction upon its visible growth; and the very possibility of another epidemic was forgotten by the people, who supposed the entrance to their city well guarded by vigilant sentinels. Indeed, the death-rate for that year was 1.5 per 1,000 lower



than that of the year immediately preceding, though still far above the usual rate in other cities between which and Buenos Ayres comparison was allowable.

The situation remained unchanged until the early days of 1871, when some cases of yellow fever were reported in the southern extremity of the town. How had the enemy entered, and who was to blame for the neglect? Investigation was idle; the yellow fever, the terrible yellow fever, was in their midst, and the affrighted inhabitants anxiously occupied themselves with the thought: what is likely to be the severity, and what the extent of the visitation?

Every one, families and individuals, who could do so, left the city, in search of a refuge from death, that stared them in the face. The pestilence, in the mean time, spread apace, and gained in intensity as it spread. It attained its maximum severity in April, and thenceforward gradually subsided, until the end of May or beginning of June, when the last cases occurred. The epidemic had extended throughout the entire city. Its ravages were truly awful; 106.5 of every 1,000 inhabitants died in that year, including in the population those who were saved by withdrawing to the rural districts—some 60,000 persons. Such mortality was beyond all imagination: one out of every nine inhabitants is a death-rate unprecedented in the civilized world in the nineteenth century; nor is it possible to describe the feelings of anguish and terror which it left in the breasts of the survivors.

It then became deplorably evident that the hygienic condition of Buenos Ayres was unfavorable in the extreme, and that the prompt investigation and removal of the causes of the evil, at any sacrifice, were matters of the utmost urgency. Under the promptings and counsel of science and experience, works of sanitary improvement were at once commenced, at the completion of which we shall be in possession of that salubrity so much to be desired, and which is always the reward of man's efforts to secure it. The lesson was a severe one.

It is only within the past few years that the beneficial results of the sanitary sciences have been experienced, even in Europe itself. To know that many diseases are avoidable, inasmuch as their determining causes are known and may be

suppressed, is the first step, and comes within the province of science. The will and the means necessary for the removal of those causes are to be applied by the people, through their municipal or political organization. The world has been very tardy in learning to know itself in this respect, and is still slow in reaching the ultimate consequences. It is not, therefore, to be wondered at that Buenos Ayres should have been so ignorant, and still more neglectful than ignorant, of the interests of the public health. Its very rapid growth warrants the presumption that its sociological evolution may possibly partake of a somewhat tumultuous character. Political agitations on the one hand, apt on occasions to assume convulsive forms; inward satisfaction of conscious advancement on the other, with the accumulation of stimuli developed in a feverish and progressive society, and the complete concentration of power, individual and collective, in pursuit of the more material and tangible ends of human energy, were so many influences tending to divert, and which have in reality diverted, the minds of men from those other interests, more radical and enduring, if we will, but less peremptory than the first, because their sphere is not measured by common vision, and because a catastrophe is at times required to bring them to the public attention.

Although the foregoing reflections do not strictly form a part of the principal object of the present review, they bear so close a relation to it that I could not forbear including them, they having been suggested to me in the course of my statistical inquiries. It also appears to me proper to mention, in this place, the chief causes of the increased mortality, though they differ in no respect from those which—in all cities where the laws of hygiene are imperfectly observed—contribute to augment the number of deaths.

In Buenos Ayres, as in all Spanish towns, the streets are narrow, and they present, together with the few small public squares, an area of very inconsiderable extent. It is to be remembered that the proportion of the municipal area to each inhabitant, as mentioned in a preceding page—70 metres—is the average proportion, there being many parts of the city sparsely populated; and it is likewise to be borne in mind



that in most houses considerable space is devoted to extensive court-yards, etc. As the population increases, these relative advantages grow less, and they will become altogether null at no far distant day, unless prudent forethought lead to the enlarging of the squares, and the converting them into health-giving parks, and the widening some of the streets into vast and spacious avenues.

In the course of the past twenty-four years about two-thirds of the city have been rebuilt, but without any attempt having been made to improve that opportunity by adopting a methodical system of widening, save only in the new streets of the suburbs.

A grave error was committed in using the filth of the town for the purpose of filling up and levelling some of the streets, which were immediately paved over. The filth thus employed consisted of a heterogeneous mass, principally made up of the refuse from the dwellings, that is to say, animal and vegetable matter united with the dust and other elements, comprising house and street sweepings. Such a sediment, destined to be decomposed by putrid fermentation and give place to the generation of mephitic gases, which escape through the porous surface stratum, and, mingling with the air to be breathed by the inhabitants, constitutes an inexhaustible source of poison for the atmosphere. Indeed, it has been observed that the people dwelling in the wards here described, have been relatively the principal sufferers during epidemics, and that some portions of those districts are rarely exempt from typhoid fevers, especially in the spring and summer seasons.

The water formerly used in Buenos Ayres, both for drinking and general household purposes, was derived from three sources: the rich had rain-water preserved in impermeable tanks or cisterns; and the remainder of the population took well-water and the river-water sold in the streets, and commonly brought from that portion of the river La Plata contiguous to the town, and certainly contaminated by the fluvial population of the port, and by the liquid animal matter flowing down from the slaughter-houses situated on the borders of the Riachuelo, some two miles south of the centre of the city. With the exception of the cistern water, for the most part

good, the water chiefly used was necessarily bad, as may be presumed from the nature of the sources from which it was derived. Since 1868 steps have been taken for supplying the town with running water proceeding from a more suitable portion of the river, toward the north of the city; but the supply thus obtained is extremely limited, nor is the source from which it is taken altogether free from objection yet. The extensive works at present in process of execution will accomplish a radical improvement in this respect.

The system of privies was primitive in the extreme. The receptacles of the excrementitious matters were common cess-pools, usually sunk below the level of the subterranean water. In the soil, eminently porous in that region, a deposit of putrescible matter was maintained for years, dissolved more and more by the subterranean water, whose level has a mean alternate rise and fall of about six feet from the dry to the wet season. Hence, the process of absorption was rapid; and not only the gases generated by fermentation, but the liquids in which the decomposed organic matter was held in solution, impregnated the soil, vitiated the water of the wells, and sent to the surface mephitic emanations incompatible with the good health of the people who breathed an atmosphere thus poisoned. In 1868 a new system of impermeable privies was instituted; but it has not yet become sufficiently general in its application, and since 1871 the plan has been put into practice of emptying and cleaning the privies by a pneumatic mechanism similar to that so successfully applied in France. The works of drainage and sewerage, so actively prosecuted at the present time, are destined to radically remove this infection, which experience has demonstrated to be one of the most fruitful causes of disease and death.

Before closing this tedious enumeration I must add, that there existed two other foci of infection in Buenos Ayres. One of these was an immense heap of refuse made up of animal and vegetable matter in full course of decomposition, accumulated some three miles southwest from the centre of the city, and from which the noxious gases were carried to the town by the atmospheric currents, and mainly by the wind called *el pampero*, blowing in that direction from the pampas, and reputed

as the most healthful in the region. The quantity of filth gathered in that place was enormous; in 1873, three hundred tons of the pestiferous mixture were carried off daily, and in 1875, three hundred and ninety tons. Since 1873, the evil effects of the accumulation have been sensibly modified by the simple and most efficient means adopted of burning the unclean matter.

Two miles southward from the centre of the town runs the Riachuelo, which empties into the Rio de la Plata. Here the loading and unloading of the coasting and other light craft are mainly effected; and on the banks of the Riachuelo stood for many years the slaughter-houses and fat-boiling establishments, representing the two principal industries of the province, and in which as many as half a million of cattle were slaughtered annually, and more than two millions of sheep and mares, and the various parts of their carcasses prepared for commerce. All the liquid and much of the solid refuse matter proceeding from those establishments were thrown into the Riachuelo. The mass of infection thus collected may easily be imagined, and the consequent contamination of the waters by the fermentation of the organic matter, from which arose stifling gases to corrupt the air shortly to be breathed by the inhabitants of the town. So extensive were the interests connected with that ancient and remunerative industry allowed by our legislators to be carried on in the manner described, that, notwithstanding oft-repeated warnings of the grave objections offered by the nuisance, all the terror and desolation of 1871 were necessary to bring about its abrupt suppression. Many proprietors, no doubt, suffered materially by the measure; but the beneficial results to the public health were incalculable. The diminution of the typhoid fever since the removal of the *saladeros*, etc., affords an evident proof of the wisdom of the step.

Is it, then, astonishing that, under so many unfavorable circumstances, mortality should have been so great in Buenos Ayres? If the people had been informed of the number of deaths from year to year, and the relation between that number and the number of inhabitants, they would have seen that, during the years 1854-'72, the death-rate was never

less than 31 per 1,000, without counting the great epidemics; they would have understood that the severity of the cholera and yellow fever which decimated their ranks was intimately connected with causes within their midst calculated to encourage the development of contagious maladies; and they would have investigated the nature of those causes, and would have found them where all modern societies have found them, and, like the latter, would have energetically set about their removal. They would thus have avoided much grief and many losses of greater moment than the expenditure involved. There is no doubt that, if the public health be persistently and intelligently cared for, and past and future experience in this respect be profited by, the rate of mortality will in a few years descend to the level of that of London, the metropolis of the world, as it is called on account of its gigantic proportions. The climate of London is not better than that of Buenos Ayres; nor are the waters of the Lea or the Thames comparable, either for purity or abundance, to the sweet and crystalline streams of the Paraná and Uruguay, which unite to form the Plata; nor is the food used in England more healthy or nutritious than that used in the Platine city; nor is the soil of the former more extensive or more fertile than that which the latter can offer to the present and to future generations. If, in our endeavors to improve our own condition, we use the same enlightened determination which England uses and which secures for her the respect and admiration of all beholders, we shall accomplish what she has accomplished, namely, the reduction of the death-rate in her large cities from 50 per 1,000 toward the close of the last century, to 22 per 1,000, which has been the mean rate in the last few years.

Let us now see what statistics say in their austere language. Taking a series of fourteen years, from 1861 to 1875, exclusive of 1874, for which I have as yet no returns, but inclusive of 1867 and 1868 with their great cholera epidemic, and 1871 with its yellow fever, the mean annual mortality is found to be 38.9 per 1,000. If we leave out the years marked by epidemics, the mean annual rate of the eleven remaining years will be 31.3. But I prefer to present these



data in tabular form, for sake of clearness, and in order that the maximum and minimum mortality in the years referred to may be readily perceived.

YEARS.	Estimated Population.	Mortality.	Rate per 1,000.
1861.....	121,280	3,410	28.1
1862.....	127,101	4,313	33.8
1863.....	133,200	4,539	34.0
1864.....	139,593	4,378	31.3
1865.....	146,292	5,857 <sup>1</sup>	40.0
1866.....	153,313	5,111	33.3
1867.....	160,671	8,029	49.9
1868.....	168,382	6,564	38.9
1869.....	177,787	5,982	33.6
1870.....	186,320	5,886	31.5
1871.....	195,262	20,748	106.2
1872.....	204,634	5,671	27.7
1873.....	214,453	5,891	27.4
1875.....	230,000	6,751	29.3
Mean annual rate.....			38.9
Mean annual rate, leaving out the years marked by epidemics.....			31.3

In the foregoing table are included three years of dreadful epidemics. It is beyond doubt that, although the importation of contagious maladies is almost always accidental, the extent to which they spread and the severity of their character are always to be imputed to the sanitary condition of the population, and to the same account is the increased mortality to be charged. The year 1865 likewise figures in the table with a death-rate of 40 per 1,000, owing to the fact that the soldiers wounded in the first battles of the Paraguayan war, fought on Argentine territory invaded by the enemy, were brought to Buenos Ayres, and considerably increased the number of deaths registered in the city. Deaths occasioned by war should also appear in vital statistics: they are losses of life; and, sooth to say, the cause to which they are due is among those most easily avoidable.

With these observations, the mean annual rate for the period we have chosen may readily be estimated. If we leave out the epidemic years and the first year of the Paraguayan

<sup>1</sup> Commencement of the Paraguayan war.

war, the mean annual rate of the ten remaining years will be 31 per 1,000.

Let us see the state of things in New York during the same period. As will be observed in the subjoined table, I have adopted the figures of the census returns of 1860 and 1870, and computed the population of the intervening years and of 1861 by applying the mean annual rate of increase corresponding to 1.5 per centum. For the years following 1870 I have, for reasons already hinted in this review, adopted 2.1, the mean annual rate of increase admitted by the Board of Health. The State census of 1865 has always been regarded as too low; and such must be the case, for, by comparing the population as set down in that census with the mortality for that year, the death-rate would be 35.4, which is inadmissible, as being out of proportion with the rates of the previous and succeeding years.

YEARS.	Population.	Deaths.	Rate per 1,000.
1861.....	825,873	24,525	28.4
1862.....	838,260	23,150	27.6
1863.....	850,833	26,617	31.2
1864.....	863,625	25,792	29.9
1865.....	876,579	25,767	29.3
1866.....	889,726	26,815	30.1
1867.....	903,071	23,159	25.6
1868.....	916,641	24,889	27.1
1869.....	930,337	25,167	27.0
1870.....	942,292	27,175	28.8
1871.....	962,079	26,976	28.0
1872.....	982,282	32,647	33.2
1873.....	1,002,909	29,084	28.9
1874.....	1,023,969	28,727	28.0
1875.....	1,045,467	30,709	29.3
Mean annual rate of mortality per 1,000.....			28.8

In comparing the two tables, I have only to observe that the death-rate for the years 1872 and 1873 in Buenos Ayres is lower than that for the same years and the year 1874 in New York; while that for 1875 is precisely the same in both cities; that the number of still-born infants is included in the total of deaths in Buenos Ayres, but not in that of the deaths in New York, according to the usual custom in the United



States and England; and finally, that, of the total number of deaths figuring opposite the year 1875 in the Buenos Ayres table, 1,041 were caused by small-pox.

*Comparative Table of the Rate of Mortality in some American and European Cities in the Year 1873.*

CITIES.	Rate.	CITIES.	Rate.
New York.....	28.9	London.....	22.8
Philadelphia.....	19.6	Liverpool.....	25.8
Chicago.....	23.8	Edinburgh.....	21.9
Boston.....	28.4	Paris.....	23.0
Cincinnati.....	22.8	Bordeaux.....	26.7
Buffalo.....	13.7	Berlin.....	27.8
St. Louis.....	19.4	Vienna.....	35.2
New Orleans.....	37.5	Valparaiso.....	50.0
Cleveland.....	19.2	Buenos Ayres.....	27.4

The statistics of mortality in Buenos Ayres are taken with commendable numerical accuracy; but that alone is not sufficient when those statistics are to form a part of the general vital statistics, in the tables of which a methodical and scientific classification is required. The classification in Buenos Ayres is defective. The deaths are registered according to the medical certificates, in which is expressed the cause of death; but the diagnosis is not submitted to the criterion of any competent authority; nor are any fixed rules observed in the preparation of the tables. The municipal employés in their turn, but so long after date as to preclude the possibility of adequate revision and correction, copy down in alphabetical order the diseases mentioned in the physicians' certificates; so that statistics thus compiled leave much to be wished for, in a scientific point of view. The establishment of a uniform system of classification for all countries would be desirable, thereby enhancing the advantages to be derived from comparative statistical studies. The classification proposed by Dr. Farr, and approved by the international statistical congress in Paris in 1855, is the one commonly followed in the United States and England; but it has not been adopted in France and many other nations, nor is it uniformly observed even in the United States. In the reports of the Chicago

Board of Health, which I have before me, I find the diseases arranged in alphabetical order, without any regard to their special character.

The publication of the complete statistics of Buenos Ayres would, therefore, be of no practical interest; and so I shall select the latest of a series of reports in my possession—that for 1875—and transcribe therefrom such portions as are necessary.

Of the 6,751 deaths registered during that year, the prevailing causes were as follows:

Small-pox.....	1,041
Phthisis.....	858
Tetanus infantum.....	445
Typhoid fever.....	140
Meningitis.....	355
Pneumonia.....	382
Organic affections of the circulatory system.....	389
Diphtheria.....	101
Diarrhœa.....	296

The mortality according to sexes was as follows:

Males.....	3,841
Females.....	2,889
Not specified.....	21
Total.....	6,751

According to ages:

Up to 5 years (including 189 still-born).....	3,521
Up to 100 years.....	3,072
Not specified.....	158
Total.....	6,751

According to nationalities:

Argentines.....	5,102
Foreigners.....	1,649
Total.....	6,751

Small-pox stands for 15.4 per cent. of the mortality of the year. Few cities present so large a number; and this is precisely the disease whose ravages may be most effectually prevented. If vaccination were made obligatory in all cases and by all means, and due care taken to be sure of the efficacy of the

virus by frequent renewal, the deaths from small-pox might be reduced to one-tenth of the number figuring in the table; particularly so when the hygienic condition of the city shall have been improved by the overground and underground sanitary works now in prosecution. The appearance of small-pox is no longer an accident, but an event of ordinary occurrence; the extent of its ravages is variable, but the disease never fails to come, as proved by the following table:

In 1869 the number of deaths by small-pox was.....	183
" 1870       "       "       "       "       " .....	195
" 1871       "       "       "       "       " .....	1,656
" 1872       "       "       "       "       " .....	836
" 1873       "       "       "       "       " .....	76
" 1874       "       "       "       "       " .....	525
" 1875       "       "       "       "       " .....	1,041
Total.....	4,512

being a mean annual rate of 644 during the seven years mentioned.

Such figures as these need no comment, nor even comparison with those of American and European cities or regions.

The next item of importance is that of 858 deaths from pulmonary consumption, representing 12.7 per cent. of the total mortality.

The mortality caused by phthisis has sensibly augmented in six years, as will be seen in the following table:

YEARS.	Deaths from Phthisis.	Rate per cent. of the total Mortality.
1869.....	370	6.1
1870.....	274	4.6
1871.....	495	2.4 <sup>1</sup>
1872.....	597	10.5
1873.....	755	12.8
1875.....	858	12.7

This progressive increase of tuberculosis, at a time when zymotic diseases are tending to diminish in number, save only

<sup>1</sup> The year of the great yellow-fever epidemic.

small-pox, which is due to a specific cause, can only be accounted for by an increase of dampness in the soil underlying the city, in combination with the other causes of insalubrity already mentioned, and which have as yet been but slightly modified. Dr. Buchanan observed the effects of the drainage-works in twenty-five cities in England, and reported that in all of them the general mortality had decreased, particularly that determined by typhoid fever and diarrhœa; but that in those which had been supplied with thorough sewerage, without an equally effective system of underground drainage, neither pulmonary consumption nor catarrhal affections had undergone any diminution. The immediate effect of subterranean drainage is to dry the ground, thus allowing the air to penetrate into the latter and take the place of the water throughout the thickness of dried earth, and there hasten the oxygenation of the infectious substances held in solution, and thereby establish a healthy condition of the soil. Besides, this drying process exercises a powerful influence upon the atmospheric strata immediately contiguous to the ground and forming the air breathed by the inhabitants. It has been observed as an invariable rule, easily explained by physical laws, that fogs disappear or are diminished in a remarkable degree in cities and elsewhere where the ground has been dried by drainage. From the two foregoing facts it may be deduced that the increase of tuberculosis corresponds to the increase of underground humidity in conjunction with other depressing influences; and that if we desire to put a limit to this grave malady, all the more to be feared from its hereditary character, it is necessary that a most perfect system of underground drainage should form a part of the works now in process of execution, not only to prevent the invasion of new masses of water, but to dry up that now contained in the ground, and so remove the existing infection.

Buenos Ayres is not, indeed, the city which offers the greatest mortality from pulmonary consumption. This disease has always been proportionately more destructive in New York. The statistics of fifty-five years demonstrate that, down to 1853, the disease figured from 16 to 21 per cent. of the total mortality; and that from that time forward it

has diminished in severity, as may be seen by the subjoined table, correlative to that above given for Buenos Ayres :

YEARS.	Deaths from Phthisis.	Rate per cent. of the total Mortality.
1869.....	3,864	13.37
1870.....	4,030	14.82
1871.....	4,186	15.52
1872.....	4,274	13.09
1873.....	4,134	14.21
1874.....	4,034	14.04
1875.....	4,172	13.78

Nor is New York the least favored city in this respect in the United States or Europe.

CITIES.	Rate per cent. of Deaths from Phthisis.	CITIES.	Rate per cent. of Deaths from Phthisis.
Boston.....	15.17	St. Louis.....	8.78
Philadelphia...	14.28	Baltimore.....	14.55
Portland, Me....	25.03	London.....	11.70
Cincinnati.....	11.64	Paris.....	18.90
Cleveland.....	7.76	Rome.....	11.00
Chicago.....	6.68	Naples.....	15.24

Next in order of numerical importance on our list of causes of mortality stands *tetanus infantum* or *trismus nascentium*, the number of victims to which was 445 in the year referred to, or 6.5 per cent. of the total mortality. The peculiar tendency of the soil of Buenos Ayres to determine such a considerable number of cases of *tetanus infantum*, vulgarly called the "seven days' sickness," and in England the "nine days' sickness," is a circumstance deserving experimental and scientific inquiry. This species of tetanus is regarded as traumatic and proceeding from the section of the umbilical cord : it may set in during the process of cicatrization. That this is not the only determining cause is proved by the existence of the disease in the endemic form in the city and province of Buenos Ayres, and, to a certain degree, in the other littoral provinces. That it is dependent upon the impurity of the surrounding atmosphere and the sedulous care bestowed



upon new-born infants, is demonstrated by its almost total disappearance among families comfortably situated in clean and well-ventilated houses; while the chief ravages of the affection occur among the poor, particularly in houses overcrowded with people who either know not how or are unable to give their infants that care required by their tender years.

At all events, the mortality from *tetanus infantum* has been on the decrease for a number of years, owing to the improved condition of the general hygienic police, for I have no doubt of the existence of a zymotic element in the production of the disease.

YEARS.	Deaths from Tetanus Infantum.	Rate per cent. of the total Mortality.
1869.....	630	10.5
1870.....	689	11.7
1871.....	470	2.2 <sup>1</sup>
1872.....	558	9.8
1873.....	620	10.5
1875.....	445	6.5

It is not possible to establish comparison with other cities, the tetanus of new-born infants either not being mentioned at all in their statistical reports or only figuring therein for an extremely small proportion of the total mortality. One exception I should, however, make: the city of Havana, where 388 of the 8,390 deaths which occurred in 1875 were caused by *tetanus infantum*, being 4.6 per cent. of the whole mortality.

Typhoid fever is represented in 1875 by 128 deaths. The number of deaths by this disease was 600 in 1869; but it has been gradually decreasing since the suppression of the *sala-deros* in 1871, and the destruction of the filth in 1872 and 1873. This, like the other zymotic diseases, is subordinate to the infection of the soil and air, and will continue in inverse ratio as the sanitary works now in course of execution.

I shall devote no special remarks to the other causes of death enumerated in the table, partly because they are common diseases, and again because the sanitary improvements

<sup>1</sup> Year of the yellow fever.

will exercise a certain influence upon them. After a brief examination of the subject of mortality among children in Buenos Ayres, I shall proceed to consider the relation in which the various nationalities appear before the law of death.

The number of children under five years of age who died in 1875 was 3,521, including still-born infants, or 52.1 of the total mortality for the twelvemonth. More than one-half of the deaths in Buenos Ayres are of children up to the age of five, which proportion is at once extremely large and afflicting, especially so as it seems to increase from year to year, as set forth in the annexed table:

YEARS.	No. of Deaths among Children.	Rate per cent. of the total Mortality.
1869.....	2,534	42.2
1870.....	2,690	45.7
1871.....	3,591	17.3
1872.....	2,649	45.7
1873.....	2,891	49.0
1875.....	3,521	52.1

Let us compare this table with the following one for New York during the same number of years:

YEARS.	No. of Deaths among Children.	Rate per cent. of the total Mortality.
1870.....	12,971	48.0
1871.....	13,333	49.0
1872.....	16,188	49.5
1873.....	14,182	48.7
1874.....	13,956	48.9
1875.....	14,839	48.3

From the comparison it would appear that the relative mortality among children was greater in New York than in Buenos Ayres. But in both cities it is very much greater than in localities whose hygienic condition is more favorable to general health; while, on the contrary, wherever that general condition is less favorable, infant mortality represents a still higher proportion.

Where a full grown adult may be able to brave morbid influences with impunity, a tender infant will succumb to those same influences. The mephitism of cities resulting at once from accumulation, imperfect circulation of the air, defective light, and the gases from decayed organic matter pervading the atmosphere, menaces the health of all; notwithstanding, the great majority of adults bear up under it, thanks to their fully developed vigor and the confirmed habit of their organism, inured, as it were, to those adverse circumstances.

But the infant, just emerged from the maternal cloister, innocent of the fact and of the circumstances in the midst of which he was born and lives, unaccustomed to the struggle, breathing that impure air from twenty-six to thirty times each minute, with his membranes extremely permeable, and the rapid processes of assimilation required by the progressive development of his organs; the infant, in a word, feeble, inert and defencelessly exposed to the poisonous air, without knowledge of the evil, and even helpless to avail himself of his locomotory mechanism to enable him to avoid the danger under the guidance of instinct, droops and is prostrated by disease and death. And all this without taking into account the baleful effects of hereditary transmission, whereby those tender organisms are rendered incompatible with life, poisoned as they are before birth by virulent infections which at best doom the beings who received them with the blood of their progenitors to a miserable existence.

These simple reflections, dictated by common-sense, serve to illustrate the incontestable fact, that, under whatsoever hygienic conditions, even the most satisfactory, life is surrounded by most dangers when in its dawn, and that deaths will be more numerous during that period than any other time with which it may be compared; but the same reflections serve at the same time to illustrate another phenomenon less generally known, namely, that, in proportion to the development of toxic influences in a community, not only will the general mortality be enhanced, but the relative mortality among children will be increased in a degree still much higher. This unchanging fact, proved by statistics and never contradicted by experience,

points to the conclusion that the proportion of the infant mortality to the total mortality in each community may be taken as a reliable human necrometer, and that from it may be deduced the sanitary condition of that community, even without an absolute knowledge of the population at a given moment.

Supposing, for instance, that New York should succeed in reducing its mortality from 29.3 per 1,000, as it was in 1875, to the London rate of 21 per 1,000 (which seems to me perfectly attainable in a few years, if the remedies pointed out by science were resolutely applied), the aggregate mortality would be 21,954, instead of 30,709, and the infant mortality, which reached 14,839, would not only be reduced, in proportion to the total, to 10,604, but the rate per cent., instead of 48.3, would be 40, as it is approximately in very healthy cities, and would not rise above 8,781, thereby saving more than six thousand children annually who are now sacrificed by the fatal circumstances under which they are born to await death. And, if the same reckoning were applied to Buenos Ayres, the mortality in 1875 would have been 4,830, instead of 6,751, and the corresponding infant mortality would have reached but 1,932, and 1,589 infant lives been spared.

The vital statistics of Buenos Ayres show that, of 6,751 who died in that city in 1875, 5,102 were Argentines, or 75.5 per cent. of the total number of deaths.

With the exception of 1871, in which year the number of foreigners who died was much greater than that of the natives, the latter stand in the death-returns for from 70 to 75 per cent. Indeed the exception mentioned is to be explained by the fact that 60,000 persons, almost exclusively Argentines, fled and took refuge in the rural districts, while the foreigners—workingmen with their families—remained, for the most part, in the infested town and bore the brunt of the pestilence.

For the sake of clearness I give the subjoined table, in which are set forth the mortality among Argentines and foreigners, and the rate per cent. of the former in relation to the total mortality in the city during a period of six years:

YEARS.	Argentines.	Foreigners.	Percentage of Argentine Deaths.
1869.....	4,203	1,779	70.2
1870.....	4,587	1,299	77.9
1871.....	8,082	12,666	38.9
1872.....	4,121	1,550	72.6
1873.....	4,319	1,572	73.3
1875.....	5,102	1,649	75.5

If we examine the figures corresponding to 1869, which present the advantage of being accurate, taken as they are from the census-returns of that year, bearing in mind that the native and foreign elements were then almost equal (89,661 Argentines, 88,126 foreigners), we shall observe that the mortality among the former was at the rate of 46.9 per 1,000, and that among the latter 20.1. And, if we take into consideration that the proportion of the foreign to the native element has increased from year to year, the marked inequality in the relative proportions of mortality in the two groups will become at once perceptible.

The gravity of such an alarming state of affairs as shown by statistics is somewhat attenuated by the fact that, among the number of deaths of Argentines is included the total mortality of children up to five years of age. Deducting the latter from the death-returns of the same year, 1869, which, as has been seen, is likewise the least unfavorable for the Argentines, and counting as adults (in as far as probabilities of life are concerned) all individuals of upward of five years of age, we shall have:

Argentines .....	4,203
Children .....	2,534
	<hr/>
	1,669
Foreigners .....	1,779

that is to say, a slightly greater mortality among foreign adults. It is, however, to be observed that, of the 23,367 children (up to 5 years) shown by the census, 2,290 were born out of the republic. The portion of these numbering among the children who died in that year, and who were naturally registered according to their respective nationalities, form a part of



the 1,779 foreigners of the death-returns, and hence cannot be deducted from the total of the Argentine infant mortality. If 9.8 per cent. of the infant population, up to five years, is made up of foreign children, it is fair to suppose that at least 9 per cent. of the infant mortality belonged to that category, in which case the approximate result would be:

Total of deaths among children.....	2,534
Nine per cent. of foreign children.....	228
<hr/>	
Number of Argentine children.....	2,306

which, deducted from the total Argentine mortality, leaves, instead of 1,669, a remainder of 1,897, a number now much higher than that of the deaths among foreigners.

Before proceeding any farther with the review of the sad details suggested by the foregoing results, let us compare these with those of the corresponding table for New York, as follows:

YEARS.	MORTALITY.		Percentage of Americans.
	Americans.	Foreigners.	
1868.....	16,805	8,084	67.5
1870.....	17,471	9,714	64.2
1871.....	17,470	9,566	64.7
1872.....	21,448	11,199	65.6
1873 .....	19,135	9,949	65.7

Taking the year of the census in which the population was composed of 523,198 Americans and 419,094 foreigners, the mortality among the former was 33.3 per 1,000, and among the latter 23.1 per 1,000. If the children be also deducted, for the same reason as in the case of Buenos Ayres, the balance of the adult mortality is in favor of the native population, in the proportions of 4,671 deaths of adult Americans and 9,714 foreigners, regarding as adults, as usual in my calculations, all the inhabitants of upward of five years.

It is necessary here to make two observations concerning these comparative results: the first, in reference to the difference of ages between Buenos Ayres and New York, whence it

appears that the inhabitants under five years of age constitute, in the first city, 13.1 per cent. of the total population, as may be seen by the census returns, while in the second they represent but 11.8 per cent., and, consequently, that the mass of inhabitants among whom death makes its most abundant harvest is relatively larger in Buenos Ayres. The second is contained in the following words of Dr. Elisha Harris, recorder of vital statistics of the New York Board of Health: "We next notice that more than half of the total population which is over five years of age is of foreign birth, and that families, the heads of which are of foreign birth, constitute the chief portion of the tenement population, as shown by the returns of census-takers in the different wards." . . . "Vigorous as the better portion of foreign residents are, the rate of mortality in their children is excessive." These statements go to show that the mortality among foreigners of over five years of age, who live under such depressing circumstances, as also among their young children, must be greater than that among the native population, by whom other advantages are enjoyed.

There is in all this something more radical and serious than mere numbers. In order to attenuate the consequences of the vital statistics, the argument of the mortality among children is at all times adduced, and their number deducted from that of the deaths among natives, thereby proving that, from the age of five years upward, the vital energy to resist disease and death is no greater in foreigners than in natives. I do not wish to discuss this point, respecting which much might be said in view of the lessons of history and of the biological sciences; but I must say something upon the subject of the element with which the balance against the native population is claimed to be closed. Considered in its relation to social mechanics, a child is assuredly not a power, but a resistance, not a force, but a burden; and, according to this incomplete and fallacious theory, the death of a child would only be a loss in the breasts of those who mourn him, and not for the producing capacity of society, especially if replaced by a vigorous adult, come whence he might. Such a doctrine, condemned by our natural feelings, by justice and by noble philanthropy, is also in opposition to the dictates of

sound reason and statistics. Socially, the child is the moral bond and the hope of the family : politically, he is the citizen of the future. The citizen who has been born and grows up in the land of his fathers, not only assimilates the materials of his organism in the continued process of rapid renovation, but takes in in that atmosphere the constituent elements of his disposition, and thus becomes by progressive education, by the contemplation of vicissitudes and of the struggles of manhood, and by the innate love of all belonging to him, the surest guaranty of the firmness of the institutions under whose influence and in whose mould he has been formed. It is, then, the duty of well-constituted societies to bestow attention upon their children in view of the double interest just referred to, and, if for nothing else, for the purpose of preserving the largest number possible for the battles of collective life.

If the mortality among Argentines in Buenos Ayres and among Americans in New York should become enhanced or retain its present proportions, it would be difficult to foretell how far the respective nationalities will become weakened as a ruling power in society, and how, little by little, that loss of influence will be felt in the customs of the people and the integrity of the institutions. In my opinion this danger is neither imaginary nor remote, and the only means I can discover by which it may be averted (and I have long studied the subject) is, the energetic improvement of the sanitary conditions of states, cities, and towns ; the reduction of mortality to its lowest possible expression (18 per 1,000, for instance) ; and the perfecting the systems of education, popular, moral, and physical. From what we have already seen concerning the susceptibility of favorable or adverse influences in infancy, if mortality be lessened, those most benefited thereby will be the children, while society, by the preservation of a larger number of them, will secure the organic advantages I have mentioned.

Statistics have also a voice in the question. The city of New York, during the seven years ending in 1873, has had a mean annual death-rate of 29 per 1,000, while the rate of births for that period has been very low. Taking the figures

as they stand in the register, the number of deaths and births was as follows :

Deaths during the seven years.....	189,385
Births   “   “   “   “ .....	119,226

---

Difference against the population..... 70,159

Which is equivalent to a loss of more than 10,000 per annum. So that, if such losses were not compensated, and even exceeded by immigration, the population would go on gradually decreasing. I should here mention that, according to official reports, the registry of births is so defective as to warrant the assumption that not more than 75 per cent. of the real number is recorded. Even accepting this hypothetical suggestion, and supposing no omissions to have occurred in the death-registers, we should have :

Deaths.....	189,385
Births.....	158,968

---

30,417

which still leaves a considerable loss for the population. And, in order to avail ourselves of these figures, let us suppose the mortality in New York to be reduced to 21 per 1,000; in which case we should have the following results :

Deaths.....	140,692
Births.....	158,968

---

18,276

leaving a balance of 18,276 in favor of the population, in place of a real loss, as it has been sustaining; and that without taking into account the positive fact, based on experience, that the number of births increases with the improvement of the sanitary condition of the city. It is likewise to be borne in mind respecting children, that mortality among them decreases much more rapidly with an improved healthy condition of the city than among adults; so that, if, of the hypothetical number of deaths = 140,692, 40 per cent. had been children, the mortality of the latter would have been 56,276, instead of the 93,677, who died during the seven years, there-



by constituting an economy of 37,401 infant lives, or so many citizens or mothers of families in the course of a few years.

During the same seven years Buenos Ayres had 51,207 births and 58,771 deaths, including the three epidemics (1867, 1868, and 1871), or a loss of 7,564 inhabitants. By reducing the annual death-rate to 21 per 1,000, the mortality would have been 27,455 in the seven years, and the difference in favor of the population 23,752. I am not examining chimeras, but realities; death and life are recorded in official statistics, and the improvements which I hold as possible are graven in imperishable monuments, in the form of sanitary works in those American and European communities that have struggled gloriously with death, and conquered it.

Wherever there is death there is sickness. It is generally admitted, and to a certain extent proved by statistics, that the sickness-rate of a city or town is approximately two sick persons throughout the year to each death per annum. Hence, to ascertain the number of days of sickness suffered by the collectivity of the population, the permanent factor 730 ( $365 \times 2$ ) is multiplied by the number of deaths during the year: so that when the mortality is considerable the number of sick persons is also considerable in like proportion, which is perfectly reasonable, inasmuch as sickness and death proceed from the same causes in a given locality, acting upon each and all of the inhabitants. In 1875 the mortality was 30,709; and, if, as has been admitted, there were two sick persons for each death constantly throughout every day in the year, the number above given should be multiplied by 730, and the product, 22,417,590, would be the number of days of sickness suffered by the population collectively, which is equal to 21.4 days for each inhabitant.

One day of sickness signifies one day's labor lost for those at an age for working and producing. The number of these is easily computed when we know that, according to the census of 1870, there were in the city 350,556 persons engaged in all occupations, that is to say, 37.1 per cent. of the total population; and, by applying this percentage to the population in 1875, we ascertain that a mass of 387,769 were working, each



one of whom lost by sickness 21.4 days of work in the course of the year, and all of them collectively, 8,298,566.

The remuneration for work varying considerably, according to the nature of the occupation and individual capacity, it is not easy to adopt a uniform standard; so I shall take the lowest rate said, by the Commissioners of Emigration, to have prevailed in 1875 for persons working by the day, namely, \$1 to \$1.50, preferring the first, in order to avoid all appearance of exaggeration. The value of the labor lost would amount, at the rate of \$1 per day, to \$8,298,566.

The expenses occasioned by sickness are incident to the whole population; and the number of days' sickness by the population collectively, as above reckoned, was 22,417,590. The proximate amount of such expenses may be ascertained by means of the data furnished by the hospitals, and according to which each patient costs about \$2 per day. Now, reducing those expenses by one-half (say to \$1 instead of \$2), and including therein the outlay for professional attendance, medicines, regimen and nursing, for the inhabitants of all classes, the aggregate cost would be \$22,417,590, equal to the number of days of sickness.

I shall not present in the pecuniary form the depressing influence which morbid causes exercise upon the capacity, physical and moral, of these individuals themselves, who, by reason of their vital energy, can resist the effects of such causes and preserve their health. To eliminate and prevail over a pathological agent implies a waste of organic force in the process, and so much less force in the physical and moral aptness applied to production. *Mens sana in corpore sano*. It is enough to mention this last branch of the subject, the pecuniary value of which cannot be estimated.

Those who die during the working age have an independent value as capital irrecoverably lost. Not only the days of sickness, or the days of the year, are here lost, but the very instrument of production itself for the future. In the United States an adult immigrant is estimated as representing a capital of \$1,000 incorporated in the national wealth: now 8,580, approximately, died in 1875, in the City of New York, figuring consequently for an aggregate of \$8,580,000.

With these antecedents, every figure of which I have carefully calculated according to data, either official or of acknowledged scientific authority, the losses in the account of the public health for 1875 may be posted in the ledger of the city of New York, as follows:

Work lost.....	\$ 8,298,566
Loss, expenses incurred by sickness.....	22,417,590
Loss, adult lives.....	8,580,000
	<hr/>
	\$39,296,156

These losses cannot be avoided, but they may be considerably diminished. If the mortality had been 21 per 1,000, instead of 29 per 1,000, each of the items of the account would have been reduced in the same proportion; the aggregate would only have been \$28,452,216, and there would have been an economy of \$10,838,840.

That money saved would be equal to the interest of a capital of \$150,000,000 at seven per cent. And let it be asked of the distinguished Dr. Chandler, President of the Board of Health, or the most skilled and experienced Sanitary Engineers, either of this country or Europe, if that capital, or one-half thereof, intelligently invested in sanitary improvements in the city of New York, would not be sufficient to place that city on the level of London in point of salubrity. I am as certain the reply will be in the affirmative as I am that never was money invested in a more remunerative speculation.

As for the causes of the evil and its remedy, there is a book which contains their explanation, and which is worth a whole library. The Reports of the Board of Health enumerate those causes, accompanied by eloquent suggestions of remedies, from year to year, supported by the authority of science and study. If the reading of that book were rendered popular, the influences which make of this imperial metropolis an unhealthy city in the eyes of the laws of hygiene, people would then know in what mortiferous conditions live one-half of the population, and how they may be materially improved; what are the existing defects in the system of drainage and sewerage, and the danger of those defects being enhanced, to

the still greater detriment of the public health; the relations of meteorological phenomena to the mortality of the city would be discovered; and for each and every one of those influences would be found a certain remedy, suggested by experience both at home and abroad, or the means of attenuating such influences as are not immediately dependent upon the hand of man. The Reports of the Board of Health, once put into action, with the amplifications required by successive developments, would be sufficient to reduce, within the space of five years, the mortality of New York from 29 per 1,000 to 21 per 1,000, and thus secure all the benefits, physical and moral, to be gained by such a triumph.

It is the interest of all, both poor and rich, natives and foreigners, to aid in the realization of sanitary improvements; these being peremptorily urgent for the present and necessary for coming generations. And it must be remembered that the cost of their execution is enhanced by every day's delay. One of those omnipotent movements of opinion which in a strong-minded people are commonly attended by prodigious results would lead to the immediate and complete solution of the grand problem. Nor does this subject concern alone Buenos Ayres, in that far-distant region of America, nor New York in this part of the continent: it is a subject which affects the interests of whole nationalities. New York, in 1790, had 33,000 inhabitants; eighty years later, with a million of souls, it is the third city of the Christian world, and is marching onward to become the first at the close of the second centennial of the United States. Philadelphia competes with Berlin and Vienna; on the banks of the Mississippi is rising up St. Louis, another city which would monopolize the admiration of all who behold it, were it not that on the margin of Lake Michigan Chicago rears her head in pride before the astonished gaze of natives and foreigners—Chicago, the new-born city, which now contains a half million of human beings. What, in the course of time, will become of these grand centres of civilization, and of many others as yet without a name? The problem of their destiny is in their own hands, and sanitary science should be the chief light to guide them.

The tendency to centralization, with its advantages and inconveniences, is inherent in human nature, and not to be controlled. In 1860 there was in the United States 18 per cent. of the total population in cities of 8,000 inhabitants and upward; and in 1875 the aggregate population of the cities of 8,000 and upward amounted to 9,700,000, or 24 per cent. of the total population, this last being estimated at 42,000,000. And this in spite of the agricultural interests which should tend to disseminate the population over the entire length and breadth of the land; spite of the rivers and lakes, canals and railways, the aggregate length of which would reach three times round the terrestrial globe; spite of all these facilities for cheap and rapid transit for people and industrial products, whithersoever called by the necessity of the market.

In the Argentine Republic this instinctive force of centralization is still more marked than in the United States, and that for reasons economical and geographical readily perceived. The growth of the littoral towns is proportionately much more rapid than that of the towns in the interior, and particularly that of Buenos Ayres, where the agglomeration is altogether incommensurate with that observed elsewhere in the country. This is not a convenient place to inquire into the sociological and political consequences of this natural inequality; but, in treating of the life of cities and of the statistics of Buenos Ayres, to the latter are applicable such considerations as that species of agroupment may suggest. As for the causes of the excessive mortality of Buenos Ayres, they have now been briefly enumerated, as also the costly works in course of execution for their removal.

For the rest, in the sanitary question of cities, whatever be their population, it is incumbent, not only upon them, in as far as their circumscribed capacity extends, to assume the responsibility of the present evil and its future aggravation, but upon each and all of the inhabitants: all have to take part in the continued struggle in defense of life; the people in their varied manifestations, municipalities, legislatures, and congresses. I know not whether the illustrious Cobden and Sir Robert Peel concerned themselves little or much with matters of public hygiene, but I do know that the liberal commercial legisla-

tion established by them in England has served to improve the condition of the poor of that nation, rendering their existence less burdensome by reason of the lower prices of articles of food, and contributed effectually to lessen the number of deaths and those diseases induced by want.

In closing this hurried review, I feel it my duty to apologize to the Medical Congress for the liberty I have taken of comparisons with the vital movement of New York, without the authority of prolonged personal observation. On one hand, I should say that the Argentines ever look to this part of the world for example and stimulus ; and on the other, that I have noticed such close anthropological analogies between what I have seen during my short stay in New York and that which has long been the object of my study in Buenos Ayres, that I could not resist the desire of establishing a few comparisons, even at the risk of arriving at defective or inaccurate conclusions.



ERRATUM FOR FIRST PARAGRAPH OF PAGE 49.



The aggregate population of towns of 8,000 inhabitants each or upward, was 10,116,000 in 1875.

# MEDICAL WORKS

PUBLISHED BY D. APPLETON & CO.

<i>Anstie on Neuralgia.</i> 1 vol., 12mo.....	Cloth, \$2 50
<i>Bartholin's Treatise on Therapeutics.</i> .....	" 5 00
<i>Barker on Puerperal Diseases.</i> 1 vol.....	" 5 00
<i>Barker on Sea-Sickness.</i> 1 vol., 16mo.....	" 75
<i>Barnes's Obstetric Operations.</i> 1 vol., 8vo.....	" 4 50
<i>Bellevue and Charity Hospital Reports.</i> 1 vol., 8vo.....	" 4 00
<i>Bennet's Winter and Spring on the Mediterranean.</i> 1 vol., 12mo.....	" 3 50
<i>Bennet on the Treatment of Pulmonary Consumption.</i> 1 vol., 8vo.....	" 1 50
<i>Billroth's General Surgical Pathology and Therapeutics.</i> 1 vol., 8vo.....	" 5 00
	Sheep, 6 00
<i>Easton on the Common Forms of Paralysis from Brain Diseases.</i> .....	1 75
<i>Bulkeley's (L. D.) Acne; its Pathology, etc.</i> .....	(In press.)
<i>Combe on the Management of Infancy.</i> 1 vol., 12mo.....	Cloth, 1 50
<i>Carpenter's Mental Physiology.</i> .....	3 00
<i>Chouveau's Comparative Anatomy of the Domesticated Animals.</i> Edited by George Fleming, F. R. G. S., M. A. L. 1 vol., 8vo, with 450 Illustrations.....	" 6 00
<i>Davis's (Henry G.) Conservative Surgery.</i> .....	" 3 00
<i>Dickson on Medicine in Relation to the Mind.</i> .....	" 3 50
<i>Elliot's Obstetric Clinic.</i> 1 vol., 8vo.....	" 4 50
<i>Ecker's Convolutions of the Brain.</i> .....	1 25
<i>Flint's Physiology.</i> 5 vols., 8vo.....	Cloth, per vol., \$4 50; Sheep, 5 50
<i>Flint's Text-Book of Human Physiology.</i> 1 vol., 8vo.....	Cloth, \$6 00; " 7 00
<i>Flint's Manual on Urine.</i> 1 vol., 12mo.....	Cloth, 1 00
<i>Flint's Relations of Urea to Exercise.</i> 1 vol., 8vo.....	" 1 00
<i>Frey's Histology and Histo-Chemistry of Man.</i> .....	" 5 00
<i>Hoffmann's Manual of Medicinal Chemicals.</i> .....	" 3 00
<i>Holland's (Sir Henry) Recollections of Past Life.</i> 1 vol., 12mo.....	" 2 00
<i>Howe on Emergencies.</i> 1 vol., 8vo.....	" 3 00
<i>Howe on the Breath, and the Diseases which give it a Fetid Odor.</i> .....	" 1 00
<i>Huxley on the Anatomy of Vertebrated Animals.</i> 1 vol.....	" 2 50
<i>Huxley and Youmans's Physiology and Hygiene.</i> 1 vol., 12mo.....	" 1 75
<i>Hammond's Insanity in its Relations to Crime.</i> 1 vol., 8vo.....	" 1 00
<i>Hammond's Diseases of the Nervous System.</i> 1 vol., 8vo.....	Cloth, \$6 00; Sheep, 7 00
<i>Hammond's Clinical Lectures on Diseases of the Nervous System.</i> 1 vol., 8vo.....	3 50
<i>Hamilton's (A. McL.) Electro-Therapeutics.</i> 1 vol., 8vo.....	Cloth, 2 00
<i>Johnston's Chemistry of Common Life.</i> 2 vols., 12mo.....	" 3 00
<i>Letterman's Recollections of the Army of the Potomac.</i> 1 vol., 8vo.....	" 1 00
<i>Lewes's Physiology of Common Life.</i> 2 vols., 12mo.....	" 3 00
<i>Markee on Diseases of the Bones.</i> 1 vol., 8vo.....	" 4 50
<i>Maudsley on the Mind.</i> 1 vol., 8vo.....	" 3 50
<i>Maudsley's Body and Mind.</i> 1 vol., 12mo.....	" 1 00
<i>Maudsley on Responsibility in Mental Disease.</i> .....	" 1 50
<i>Meyer's Electricity.</i> 1 vol., 8vo.....	" 4 50
<i>Nirmeyer's Practical Medicine.</i> 2 vols., 8vo.....	Cloth, \$9 00; Sheep, 11 00
<i>Nesfel on Galvano-Therapeutics.</i> 1 vol., 12mo.....	Cloth, 1 50
<i>Nightingale's Notes on Nursing.</i> 1 vol., 12mo.....	" 75
<i>Neumann on Skin Diseases.</i> 1 vol., 8vo.....	" 4 00
<i>New York Medical Journal.</i> .....	\$4 00 per annum. Specimen copies, 35
<i>Paget's Clinical Lectures and Essays.</i> 1 vol., 8vo.....	Cloth, 5 00
<i>Peaslee on Ovarian Tumors.</i> 1 vol., 8vo.....	" 5 00
<i>Pereira's Materia Medica and Therapeutics.</i> 1 vol., 8vo.....	Cloth, \$7 00; Sheep, 8 00
<i>Richardson's Diseases of Modern Life.</i> 1 vol., 12mo.....	Cloth, 2 00
<i>Suyre's Club-Foot.</i> 1 vol., 12mo.....	" 1 00
<i>Suyre's Orthopedic Surgery.</i> With the Operations incident to Deformities. With numerous Illustrations.....	Cloth, \$5 00; Sheep, 6 00
<i>Schroeder on Obstetrics.</i> 1 vol., 8vo.....	Cloth, 3 50
<i>Steiner's Compendium of Children's Diseases.</i> .....	" 3 50
<i>Stroud's Physical Cause of the Death of Christ.</i> 1 vol., 12mo.....	" 2 00
<i>Suett on Diseases of the Chest.</i> 1 vol., 8vo.....	" 3 50
<i>Simpson's (Sir Jas. Y.) Complete Works.</i> Vol. I. Obstetrics and Gynecology. 8vo. Vol. II. Anæsthesia, Hospitalism, etc. 8vo. Vol. III. The Diseases of Women.....	Per vol., Cloth, \$3 00; Sheep, 4 00
<i>Tilt's Uterine Therapeutics.</i> 1 vol., 8vo.....	Cloth, 3 50
<i>Van Buren on Diseases of the Rectum.</i> 1 vol., 12mo.....	1 50
<i>Van Buren &amp; Keyes's Genito-Urinary Diseases, with Syphilis.</i> Cloth, \$5; Sheep, 6 00	
<i>Vogel's Diseases of Children.</i> 1 vol., 8vo.....	Cloth, \$4 50; " 5 50
<i>Wells on Diseases of the Ovaries.</i> 1 vol., 8vo.....	Cloth, 5 00
<i>Wagner's Chemical Technology.</i> 1 vol., 8vo.....	5 00
<i>Walton's Mineral Springs of the United States and Canada.</i> With Analyses and Notes on the Prominent Spas of Europe.....	" 2 00

\*.\* Any of these works will be mailed, post-free, to any part of the United States, on receipt of the price.

A large and carefully-selected stock of Medical Works, American and Foreign, constantly on hand. Descriptive Catalogue forwarded on application.

Physicians desiring to have their names inserted in our Medical Directory of the United States and Canada, will please send them in full, with addresses. No charge.

D. APPLETON & CO., Publishers, 549 & 551 Broadway, New York.

# APPLETON'S AMERICAN CYCLOPÆDIA.

NEW REVISED EDITION.

*Entirely rewritten by the ablest writers on every subject. Printed from new type, and illustrated with Several Thousand Engravings and Maps.*

The work originally published under the title of *THE NEW AMERICAN CYCLOPÆDIA* was completed in 1863, since which time the wide circulation which it has attained in all parts of the United States, and the signal developments which have taken place in every branch of science, literature, and art, have induced the editors and publishers to submit it to an exact and thorough revision, and to issue a new edition entitled *THE AMERICAN CYCLOPÆDIA*.

Within the last ten years the progress of discovery in every department of knowledge has made a new work of reference an imperative want.

The movement of political affairs has kept pace with the discoveries of science, and their fruitful application to the industrial and useful arts and the convenience and refinement of social life. Great wars and consequent revolutions have occurred, involving national changes of peculiar moment. The civil war of our own country, which was at its height when the last volume of the old work appeared, has happily been ended, and a new course of commercial and industrial activity has been commenced.

Large accessions to our geographical knowledge have been made by the indefatigable explorers of Africa.

The great political revolutions of the last decade, with the natural result of the lapse of time, have brought into public view a multitude of new men, whose names are in every one's mouth, and of whose lives every one is curious to know the particulars. Great battles have been fought, and important sieges maintained, of which the details are as yet preserved only in the newspapers, or in the transient publications of the day, but which ought now to take their place in permanent and authentic history.

In preparing the present edition for the press, it has accordingly been the aim of the editors to bring down the information to the latest possible dates, and to furnish an accurate account of the most recent discoveries in science, of every fresh production in literature, and the newest inventions in the practical arts, as well as to give a succinct and original record of the progress of political and historical events.

The work has been begun after long and careful preliminary labor, and with the most ample resources for carrying it on to a successful termination.

None of the original stereotype plates have been used, but every page has been printed on new type, forming in fact a new Cyclopædia, with the same plan and compass as its predecessor, but with a far greater pecuniary expenditure, and with such improvements in its composition as have been suggested by longer experience and enlarged knowledge.

The illustrations, which are introduced for the first time in the present edition, have been added not for the sake of pictorial effect, but to give greater lucidity and force to the explanations in the text. They embrace all branches of science and of natural history, and depict the most famous and remarkable features of scenery, architecture, and art, as well as the various processes of mechanics and manufactures. Although intended for instruction rather than embellishment, no pains have been spared to insure their artistic excellence; the cost of their execution is enormous, and it is believed that they will find a welcome reception as an admirable feature of the Cyclopædia, and worthy of its high character.

This work is sold to subscribers only, payable on delivery of each volume. It is now completed in sixteen large octavo volumes, each containing over 800 pages, fully illustrated with several thousand Wood Engravings, and with numerous colored Lithographic Maps.

## PRICE AND STYLE OF BINDING.

<i>In extra cloth, per vol.</i>	<i>5.00</i>	<i>In half russia, extra gilt, per vol.</i>	<i>8.00</i>
<i>In library leather, per vol.</i>	<i>6.00</i>	<i>In full morocco antique, gilt edges, per vol.</i>	<i>10.00</i>
<i>In half turkey morocco, per vol.</i>	<i>7.00</i>	<i>In full russia, per vol.</i>	<i>10.00</i>

\* \* \* Specimen pages of the *AMERICAN CYCLOPÆDIA*, showing type, illustrations, etc., will be sent gratis, on application.

D. APPLETON & CO., PUBLISHERS,

549 & 551 Broadway, New York.